

## Health Advisory:

### Biowatch Air Monitor in St. Louis Detects *Francisella tularensis*

October 17, 2006

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**FROM: JULIA M. ECKSTEIN  
DIRECTOR**

**SUBJECT: Biowatch Air Monitor in St. Louis Detects *Francisella tularensis***

This afternoon (October 17) the City of St. Louis Department of Health issued the following News Release:

A test from a routine air-monitoring sensor in St. Louis City was positive for the bacterium that causes tularemia, but all subsequent tests have been negative for the bacterium, according to the St. Louis City health department. Technicians collect air samples from air-monitoring sensors in the St. Louis area as part of the national Bio Watch program. This bio surveillance system includes round-the-clock monitoring stations, which have been operating in more than 30 cities across the nation since 2003.

Testing from one of the filters Monday indicated a low number of tularemia bacterium, according to Dr. William Kincaid, Director of the St. Louis City Department of Health and Hospitals. The Missouri State Public Health Laboratory (SPHL) conducted additional tests on filters picked up from the sensors early Tuesday morning. These tests were negative. As an extra precaution, the laboratory tested swabs taken from the sensors, and all of those tests also were negative.

"All additional tests have been negative for tularemia and we believe that the sensor picked up naturally occurring tularemia," said Dr. Kincaid. Bio Watch sensors have detected naturally occurring events in other cities in the past. Kincaid said tularemia occurs naturally in the United States, and Missouri had 27 human cases reported to the Missouri Department of Health and Senior Services in 2005.

"This was an excellent test of one of our important surveillance systems," Kincaid said.

"The Bio Watch monitor picked up an unusual occurrence, and all systems worked quickly to protect the health of the public," Dr. Kincaid added. He said federal, state, local and bi-state health officials showed outstanding and immediate cooperation that will be needed in any public health emergencies.

Dr. Kincaid noted that area hospitals have disease-detection systems that are monitored by the public health system. He said that as part of normal protocol and to test the system, public health officials would continue to monitor these systems to ensure there are no increased or unusual illnesses.

The purpose of this Health Advisory is to alert medical providers and public health officials of this event. The Missouri Department of Health and Senior Services (DHSS) asks providers, as is normal protocol, to immediately report any cases of illness that might be tularemia to your local public health agency, or to DHSS at **800-392-0272**.

Clinical and laboratory consultation is available from DHSS and SPHL at 800-392-0272. Note that SPHL can provide critical services to physicians and hospital laboratories that are attempting to confirm or rule out a diagnosis of tularemia.

Additional information on tularemia is available on the next page. Included here is information on the multiple clinical presentations that can be seen in patients with tularemia.

## Disease Information

Tularemia is caused by *Francisella tularensis*, a non-spore-forming, gram-negative coccobacillus. *F. tularensis* is one of the most infectious pathogenic bacteria, requiring inoculation or inhalation of as few as 10 organisms to cause disease. The incubation period for tularemia is typically 3-5 days, with a range of 1-21 days.

Primary disease presentations include ulceroglandular (typically arises from handling a contaminated carcass or following an infective arthropod bite), glandular, oculoglandular, oropharyngeal, pneumonic, typhoidal, and septic forms. Any form of tularemia may be complicated by hematogenous spread, resulting in secondary pleuropneumonia, sepsis, and, rarely, meningitis. Depending on the exposure route, infection may result in skin ulcers, painful lymphadenopathy, conjunctivitis, pharyngitis, oral ulcers, or pneumonia. A pulse-temperature dissociation may be seen.

Following an inhalational exposure, one can see abrupt onset of fever, chills, malaise, headache, myalgias, joint pain, nonproductive cough, and progressive weakness. Pneumonia can develop, accompanied by chest pain, dyspnea, bloody sputum, and respiratory failure. However, inhalational exposures can commonly result in an initial clinical picture of systemic illness without prominent signs of respiratory disease. The earliest chest x-ray findings may be peribronchial infiltrates, typically advancing to bronchopneumonia in >1 lobes, and often accompanied by pleural effusions and hilar lymphadenopathy – although such signs may be minimal or absent. (In one study, volunteers challenged with aerosols of *F. tularensis* regularly developed systemic symptoms of acute illness 3-5 days after exposure, but only 25-50% of participants had radiological evidence of pneumonia in the early stages of infection. However, inhalational exposures to *F. tularensis* can incapacitate some persons more quickly – within the first 1-2 days of illness – and pulmonary infection can sometimes rapidly progress to severe pneumonia, respiratory failure, and death.)

Although exposure to aerosolized *F. tularensis* is expected to principally cause primary pleuropneumonic infection, some exposures might contaminate the eye (resulting in ocular tularemia with conjunctivitis), penetrate broken skin (resulting in ulceroglandular or glandular disease), or cause oropharyngeal disease (with pharyngitis and cervical lymphadenitis).

Person-to-person transmission of *F. tularensis* is not known to occur. Use Standard Precautions. Note that infectious organisms can be found in the blood and other tissues. Organisms in culture are highly infectious and special precautions must be taken during isolation.

If tularemia is suspected, the laboratory should be alerted to the need for special diagnostic/safety procedures. Obtain blood specimens along with any appropriate tissue specimens (e.g., liver, spleen, lungs, or lymph nodes). If there is respiratory involvement, sputum and/or bronchial/tracheal washings should also be obtained. Standard tests for the detection of *F. tularensis* include Gram stain, certain other tissue stains, and bacterial culture. Culturing the organism is the definitive means of confirming tularemia. Blood can be cultured, but is seldom positive. Antibody tests are available, but serum antibody titers do not typically attain diagnostic levels until >10 days after illness onset.

**The Missouri State Public Health Laboratory (SPHL) can provide critical services to physicians and hospital laboratories that are attempting to confirm or rule out a diagnosis of tularemia.** For more information, go to: <http://www.dhss.mo.gov/Lab/BioTerrorism/TularemiaFactSheet.pdf>. Clinical and laboratory consultation is available from DHSS and SPHL at **800-392-0272**.

The following references provide additional information on tularemia.

1. Dennis DT, Inglesby TV, Henderson DA, et al. Tularemia as a biological weapon. *JAMA* 2001; 285(21): 2763-73. <http://jama.ama-assn.org/cgi/content/full/285/21/2763>
2. Infectious Diseases Society of America. *Tularemia: Current, comprehensive information*. <http://www.cidrap.umn.edu/idsa/bt/tularemia/biofacts/tularemiafactsheet.html>
3. Tularemia (USAMRIID's Medical Management of Biological Casualties Handbook) See pages 52-57. <http://www.usamriid.army.mil/education/bluebookpdf/USAMRIID%20Blue%20Book%205th%20Edition.pdf>